

FIG. 1

RAMAN AMPLIFIER OF FIRST EMBODIMENT OF PRESENT INVENTION

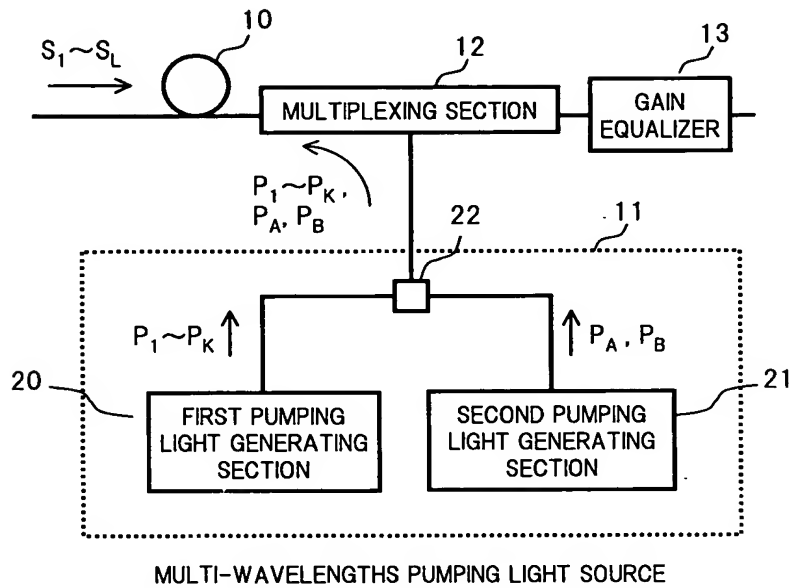


FIG. 2

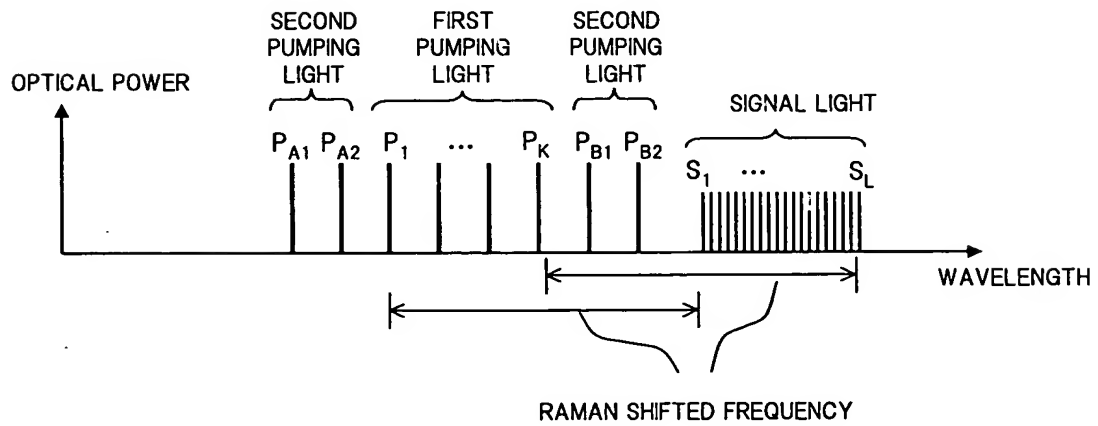


FIG.3

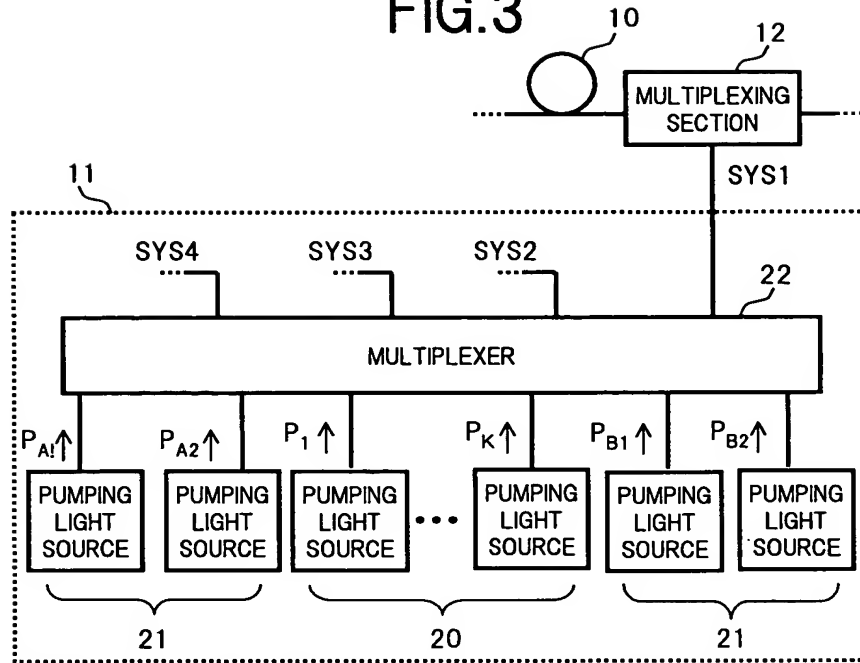


FIG.4

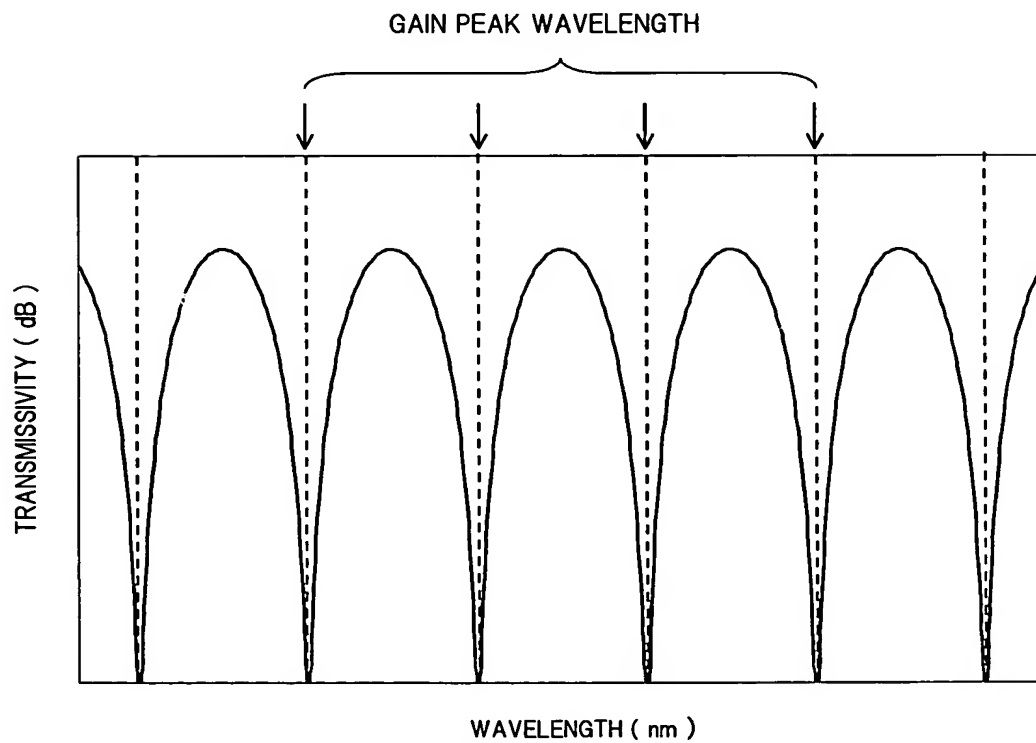


FIG.5

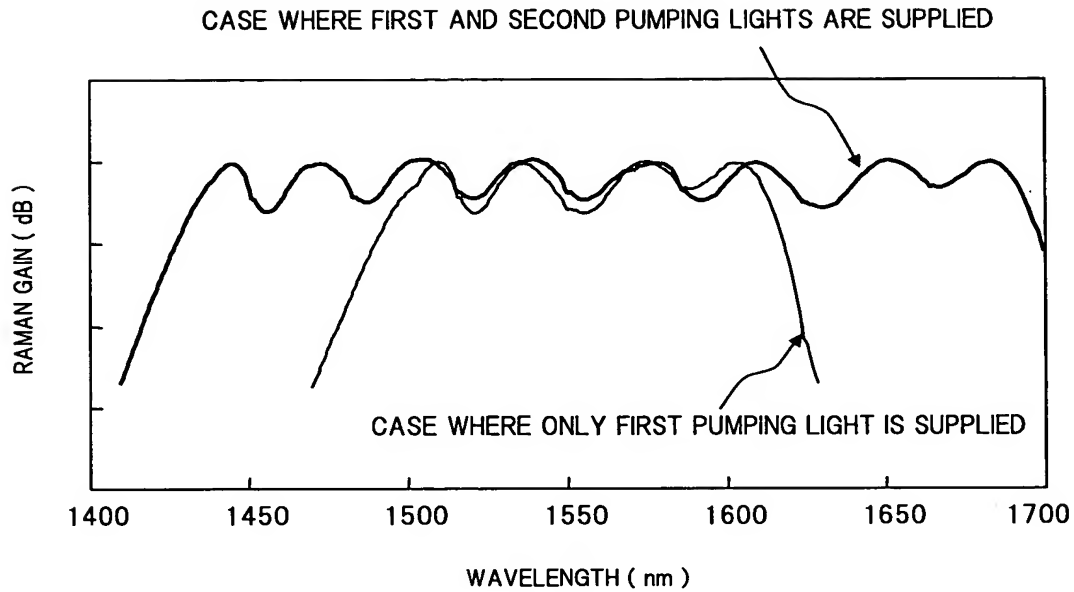


FIG.6

RAMAN AMPLIFIER OF SECOND EMBODIMENT OF PRESENT INVENTION

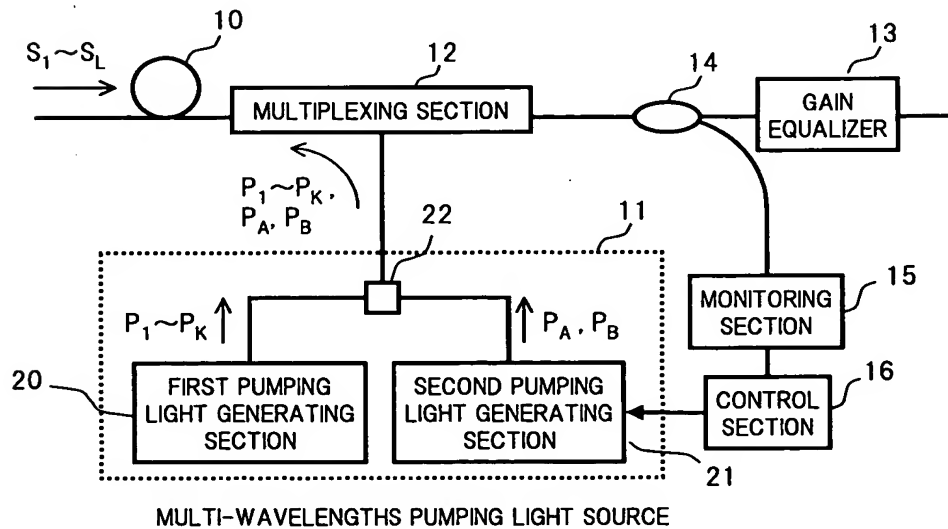


FIG.7

RAMAN AMPLIFIER OF THIRD EMBODIMENT OF PRESENT INVENTION

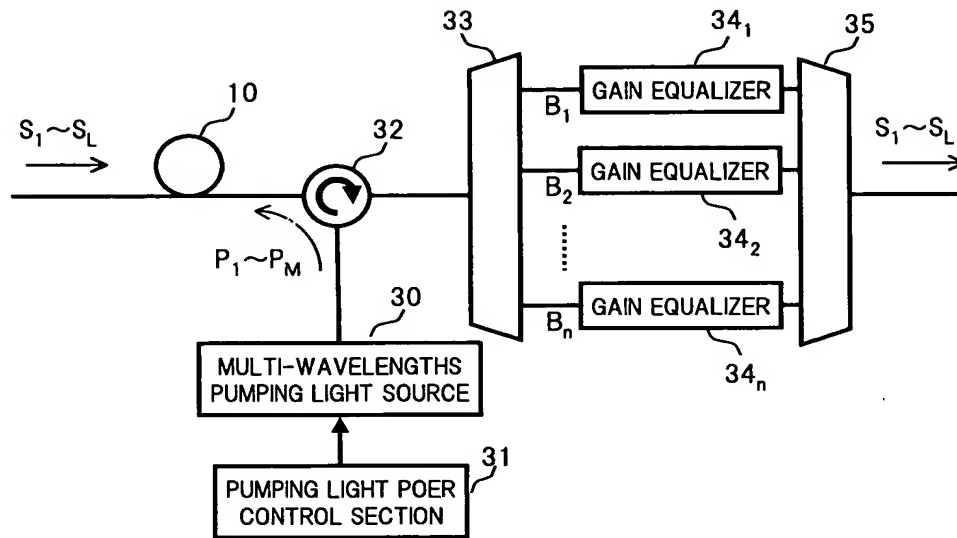


FIG.8

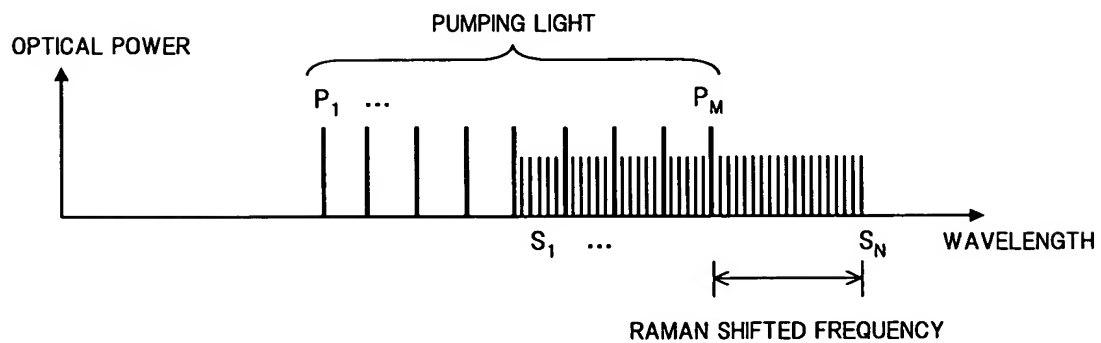
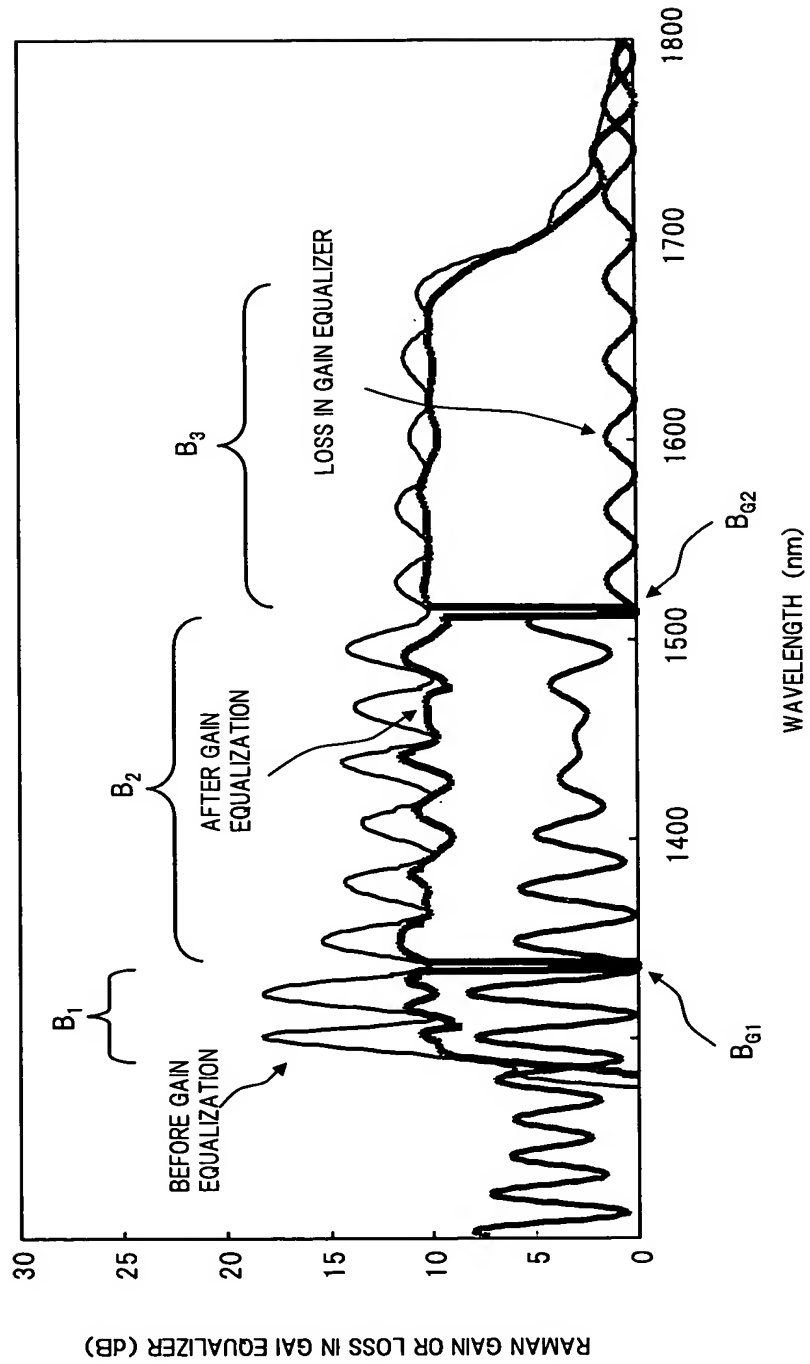


FIG.9



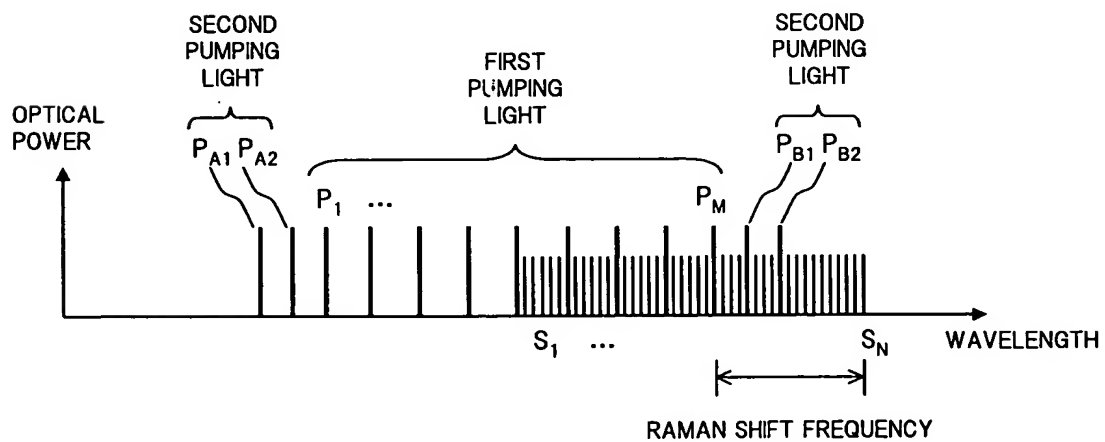


FIG. 12

RAMAN AMPLIFIER OF FOURTH EMBODIMENT OF PRESENT INVENTION

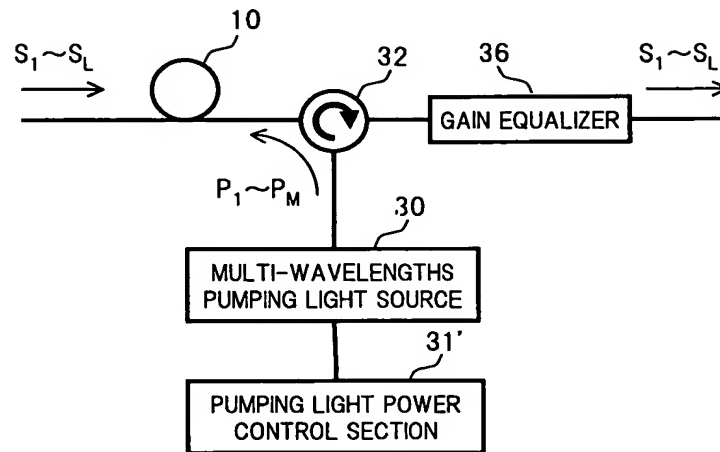


FIG.13

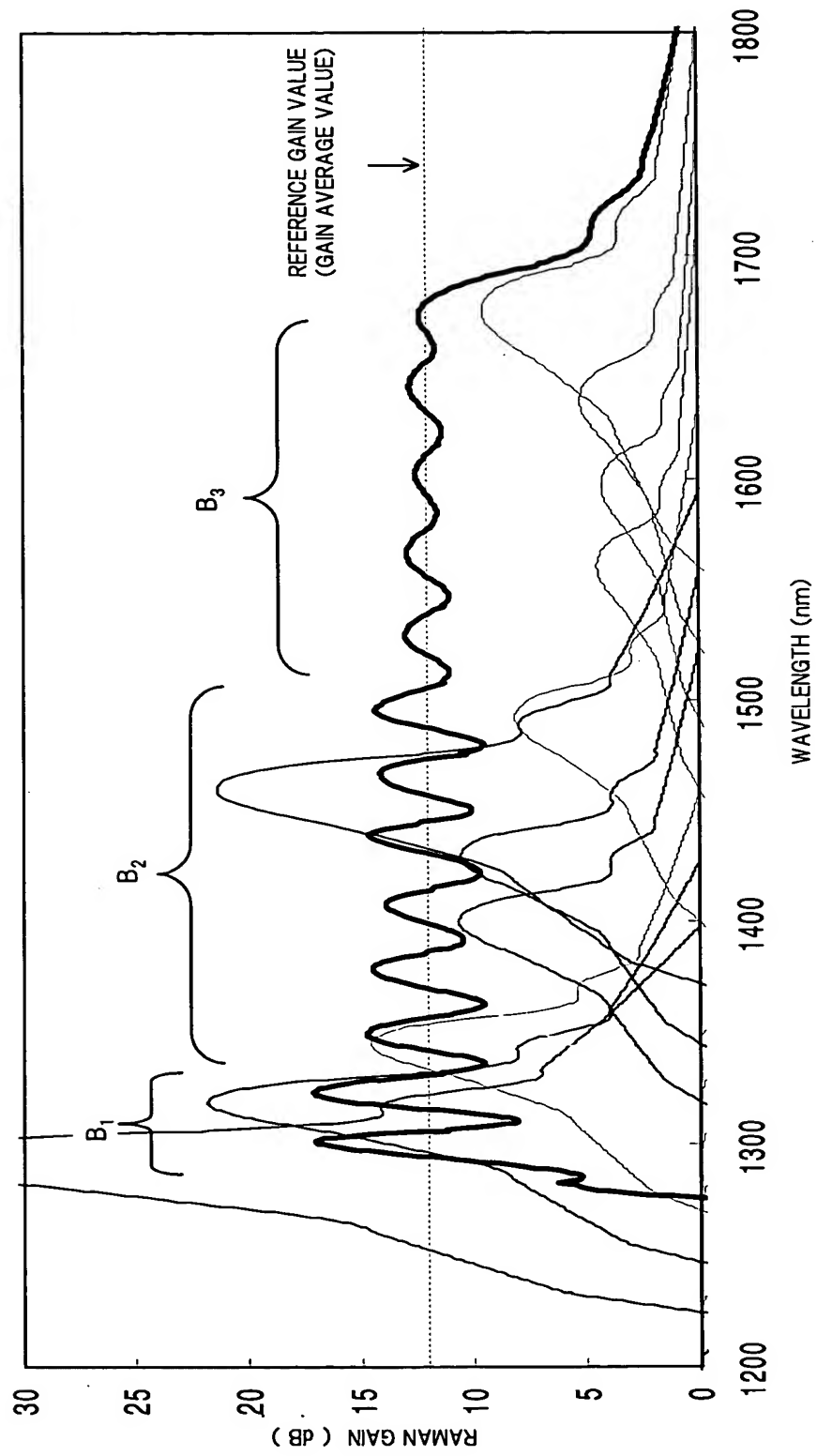


FIG.14

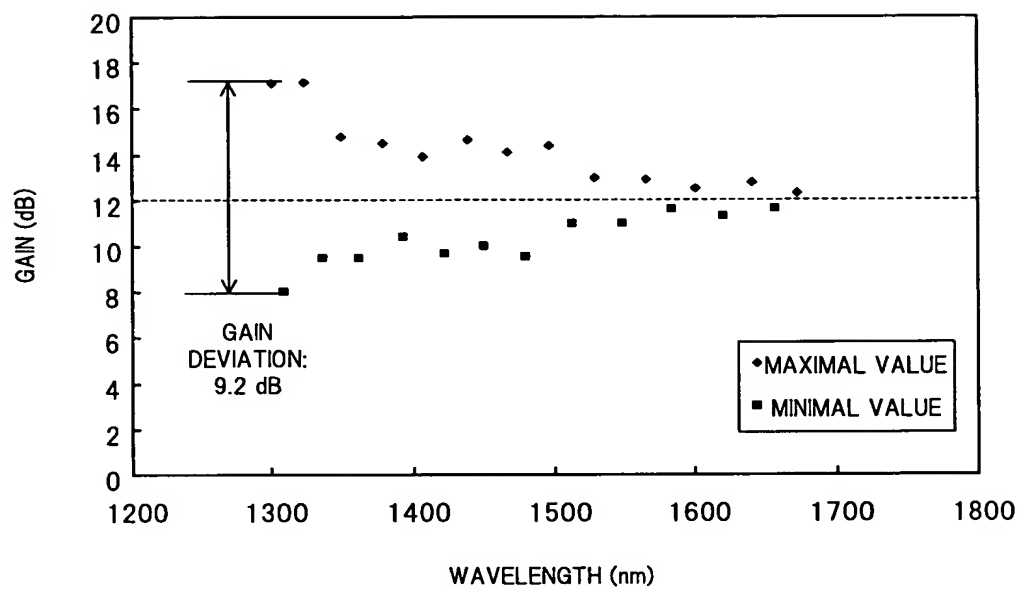


FIG.15

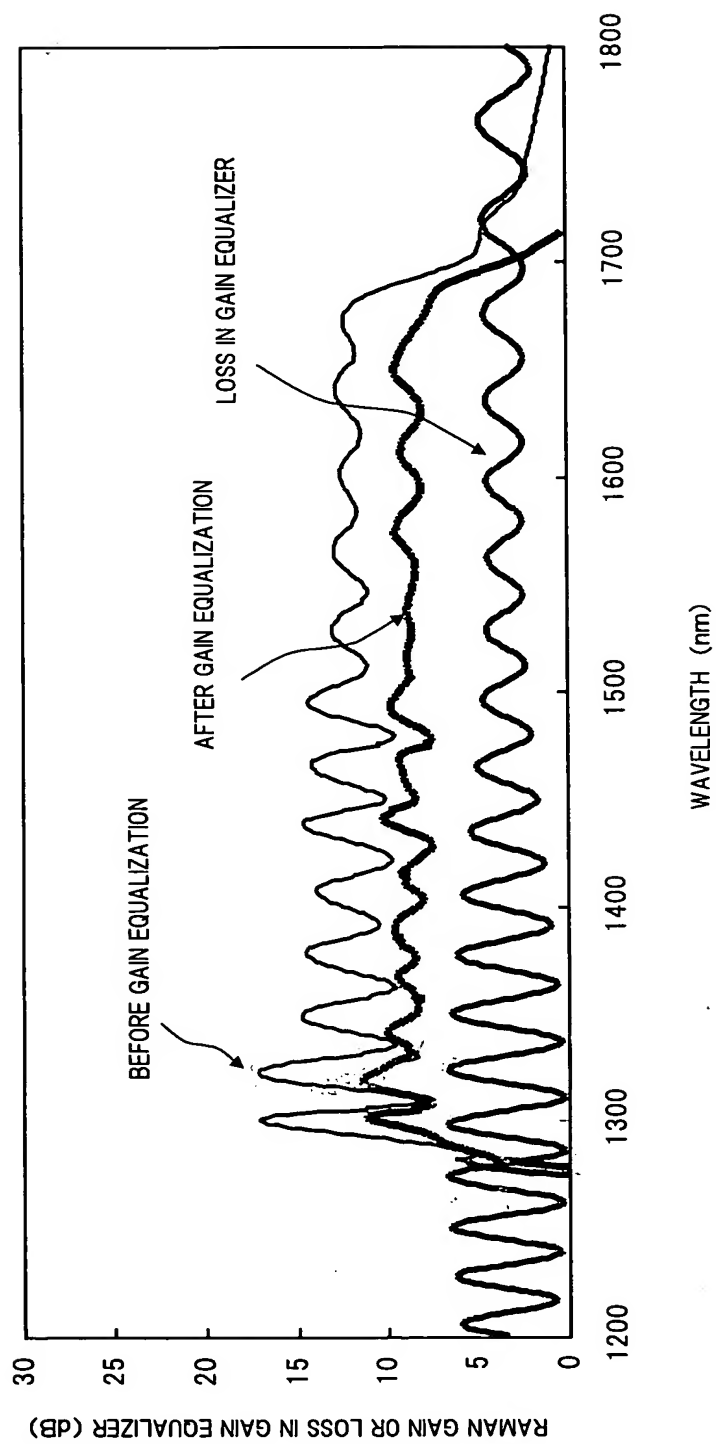


FIG.16

RAMAN AMPLIFIER OF FIFTH EMBODIMENT OF PRESENT INVENTION

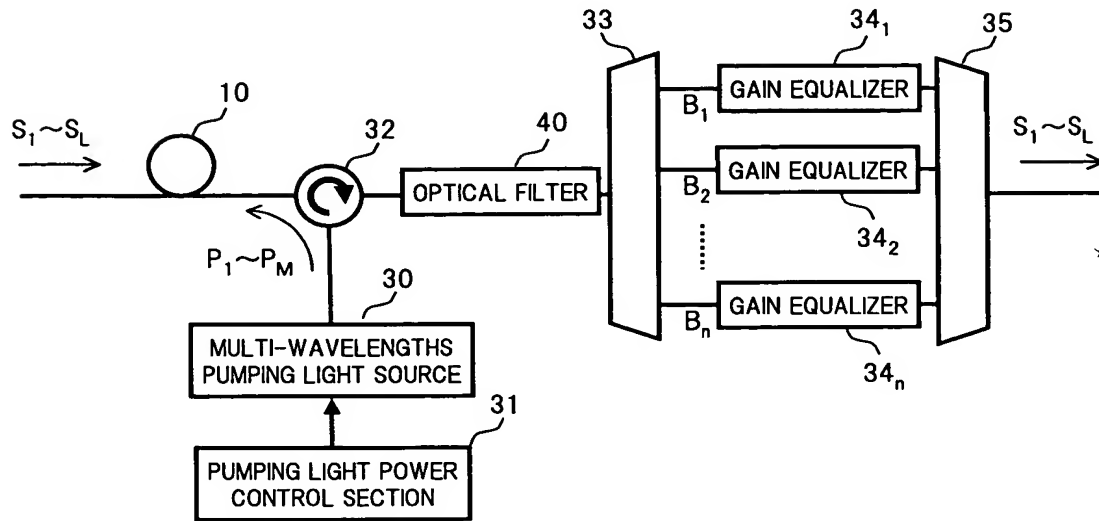


FIG.17

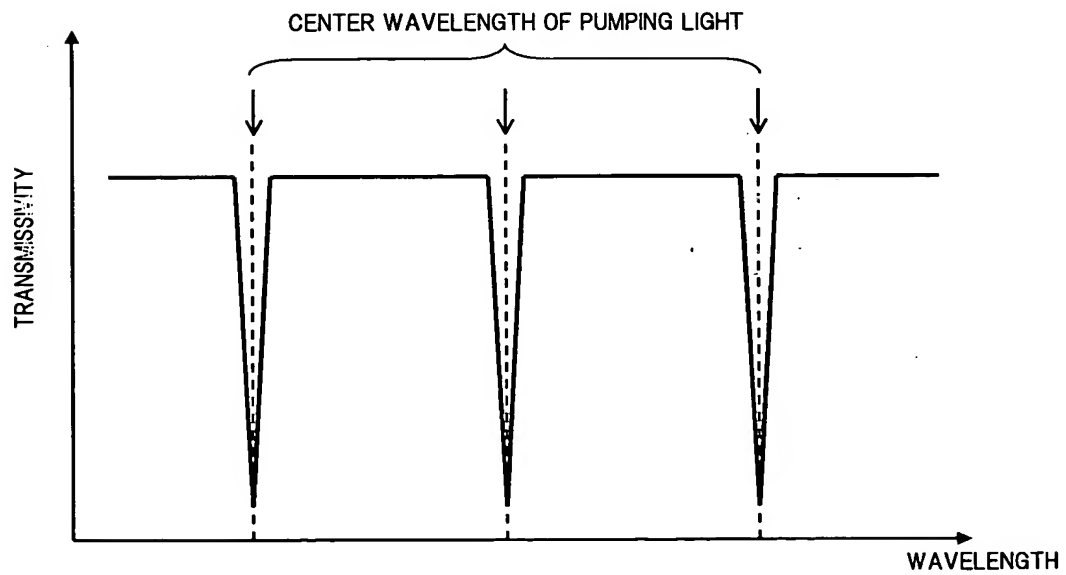


FIG.18

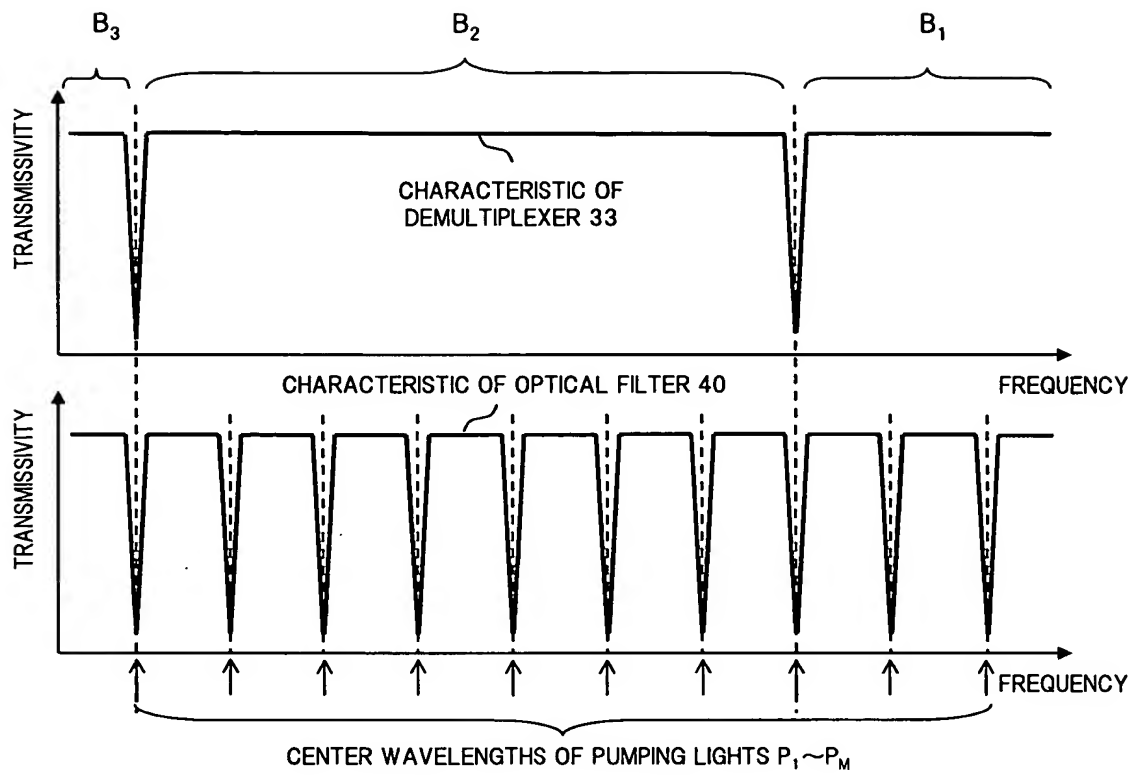


FIG.19

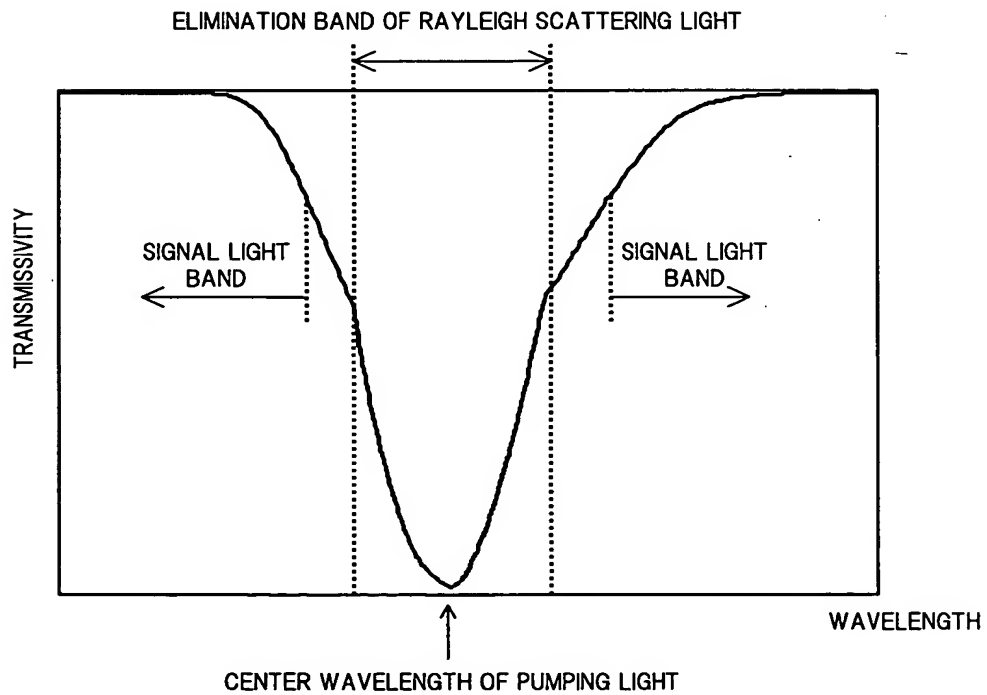


FIG.20

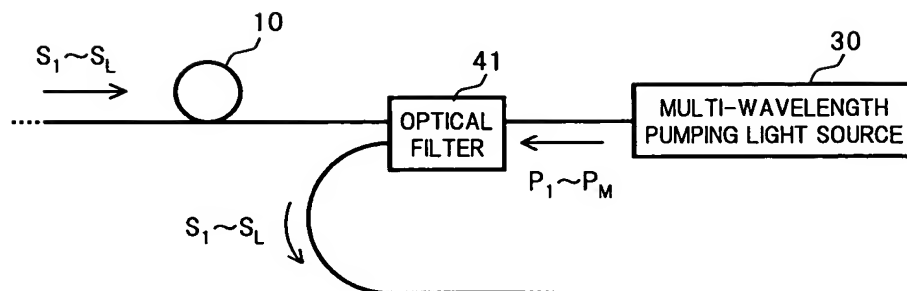


FIG. 21

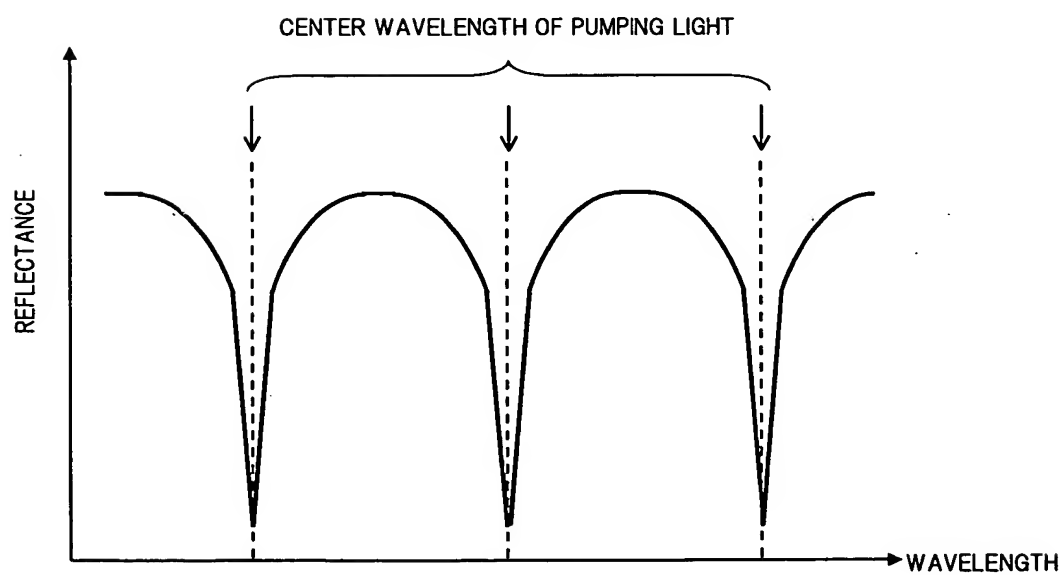


FIG.22

OPTICAL TRANSMISSION SYSTEM ACCORDING TO SIXTH EMBODIMENT OF PRESENT INVENTION

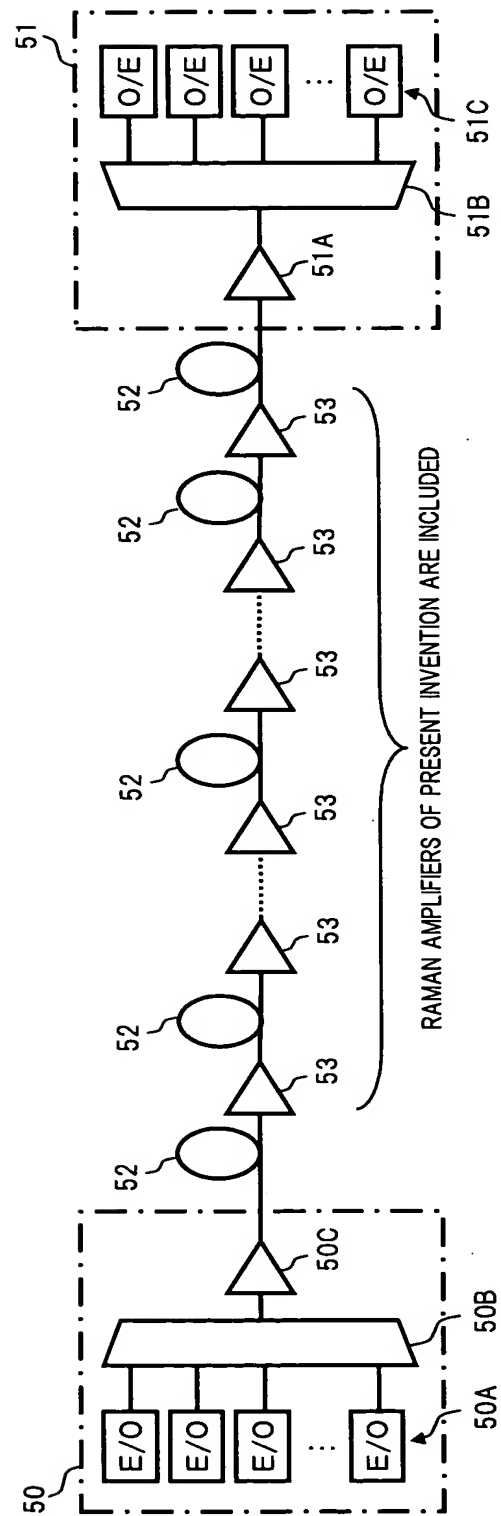


FIG.23

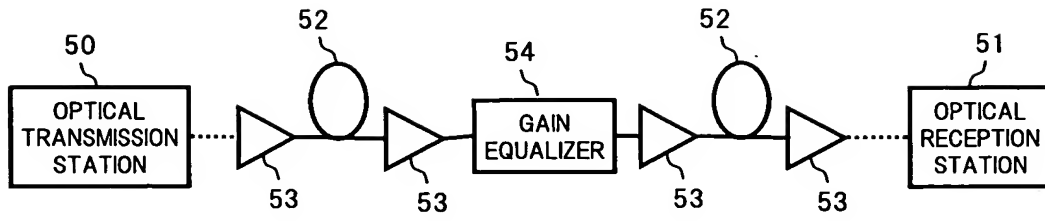


FIG.24

CONFIGURATION EXAMPLE OF CONVENTIONAL RAMAN AMPLIFIER

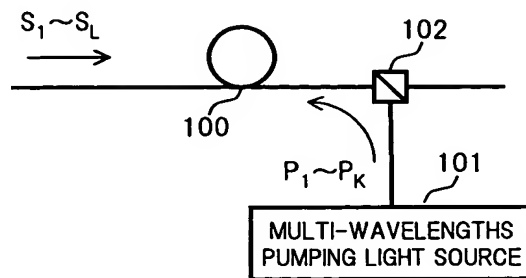


FIG.25

WAVELENGTH ALLOCATION EXAMPLE IN CONVENTIONAL RAMAN AMPLIFIER

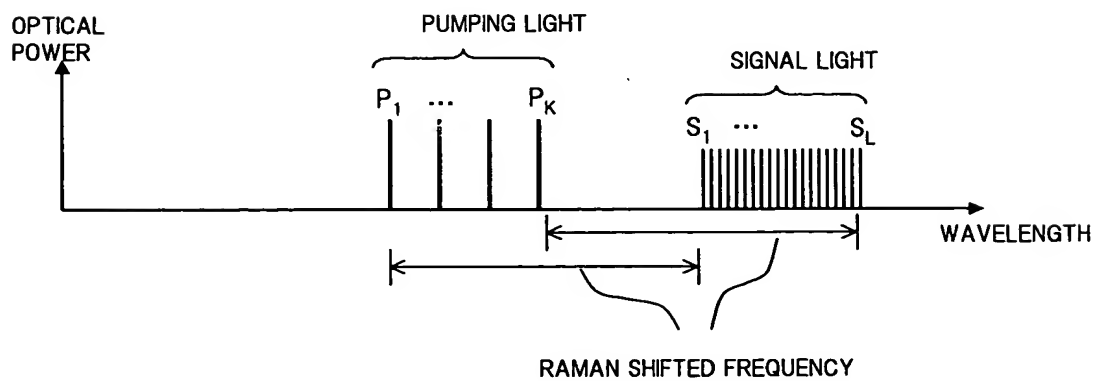


FIG.26

ANOTHER CONFIGURATION EXAMPLE OF CONVENTIONAL RAMAN AMPLIFIER

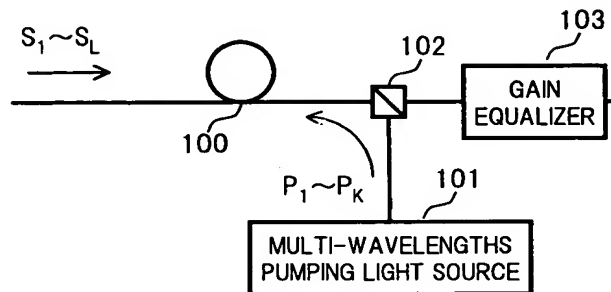


FIG.27

ANOTHER CONFIGURATION EXAMPLE OF CONVENTIONAL RAMAN AMPLIFIER

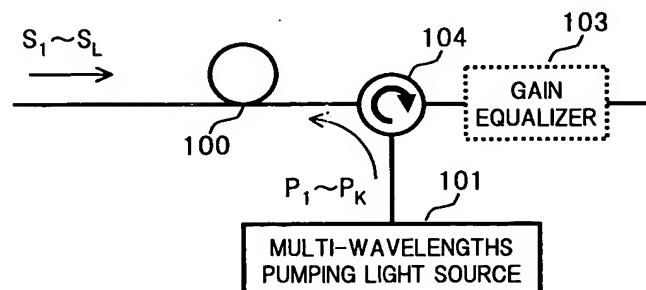


FIG.28

ANOTHER WAVELENGTH ALLOCATION EXAMPLE IN CONVENTIONAL RAMAN AMPLIFIER

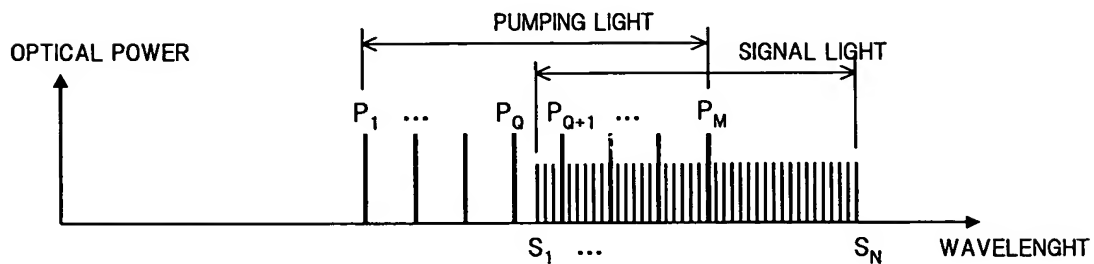


FIG.29

EXAMPLE MODULATION SYSTEM FOR PUMPING LIGHT

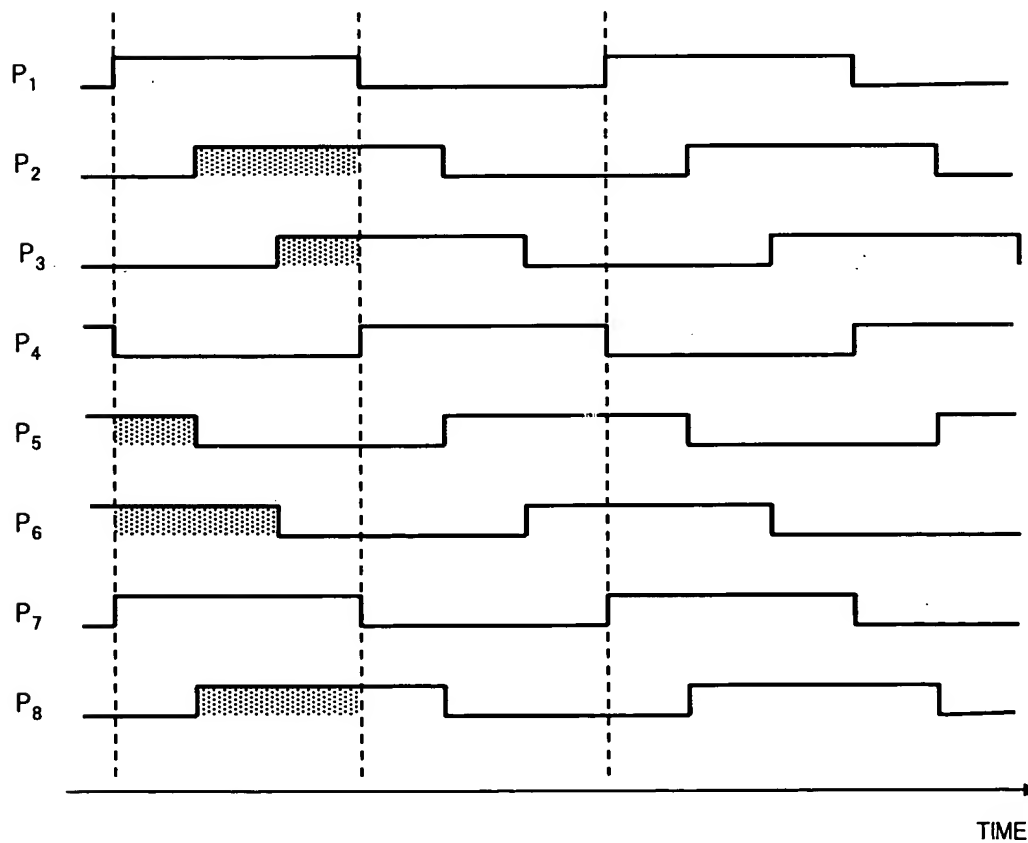


FIG.30

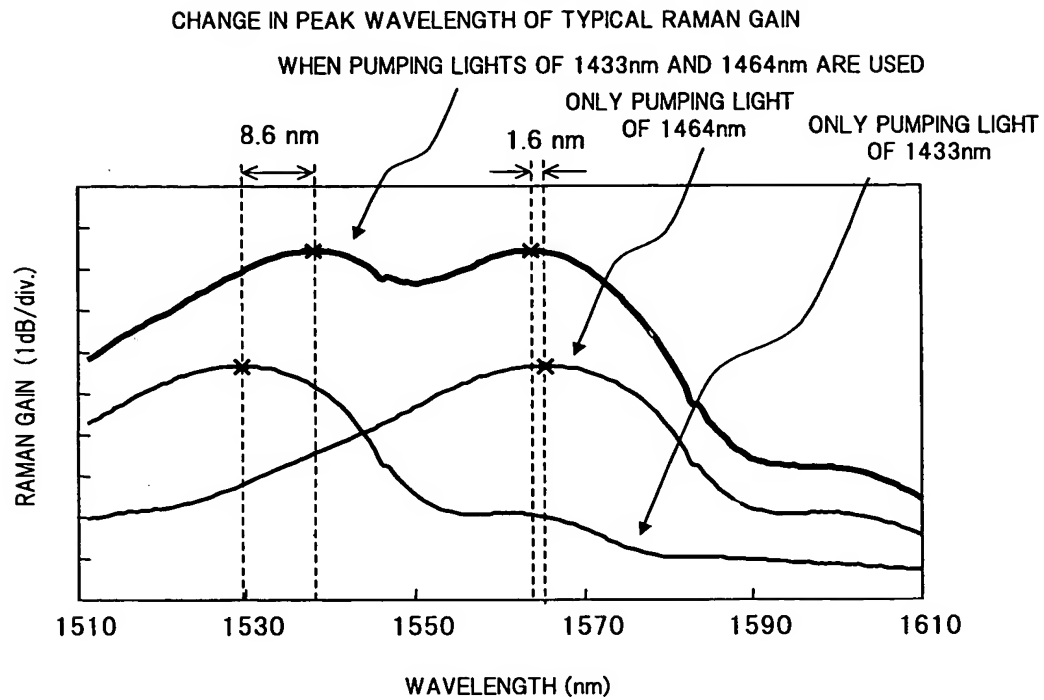


FIG.31

EXAMPLE OF CASE WHERE PUMPING LIGHT IS ARRANGED AT UNEQUAL INTERVAL

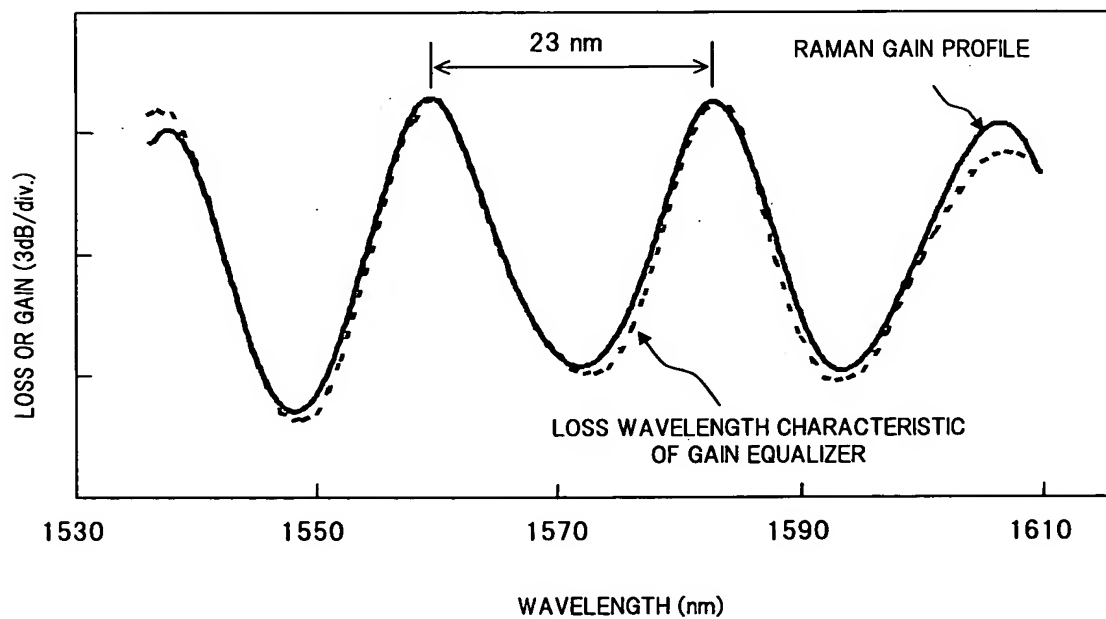
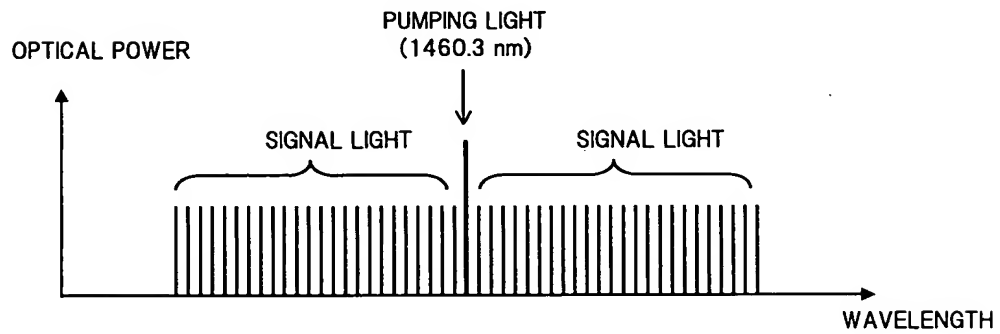
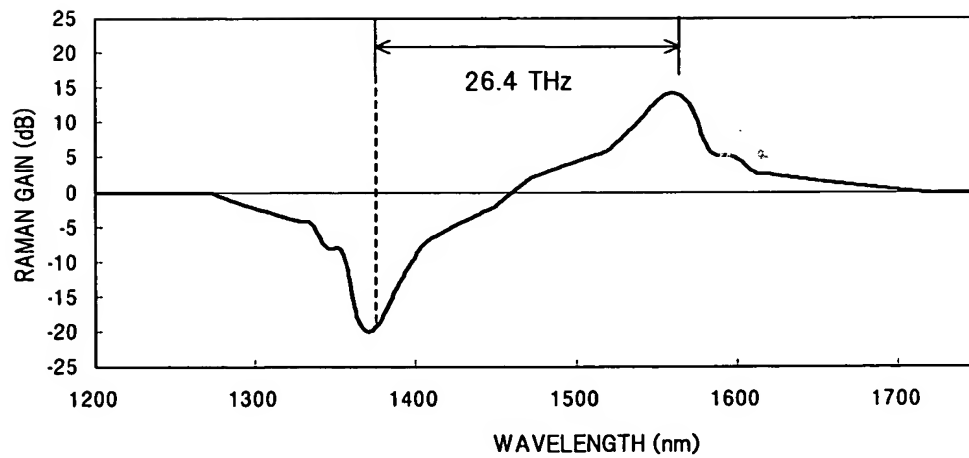


FIG.32

EXAMPLE OF WAVELENGTH ALLOCATION IN WHICH SINGLE PUMPING LIGHT
IS MIXED IN SIGNAL LIGHT BAND

**FIG.33**

RAMAN EFFECT BY PUMPING LIGHT OF 1460.3 nm



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FIG.34

EXAMPLE OF GAIN WAVELENGTH CHARACTERISTIC OF CONVENTIONAL RAMAN AMPLIFIER
HAVING AMPLIFICATION BANDWIDTH ABOUT FOUR TIMES RAMAN SHIFTED FREQUENCY

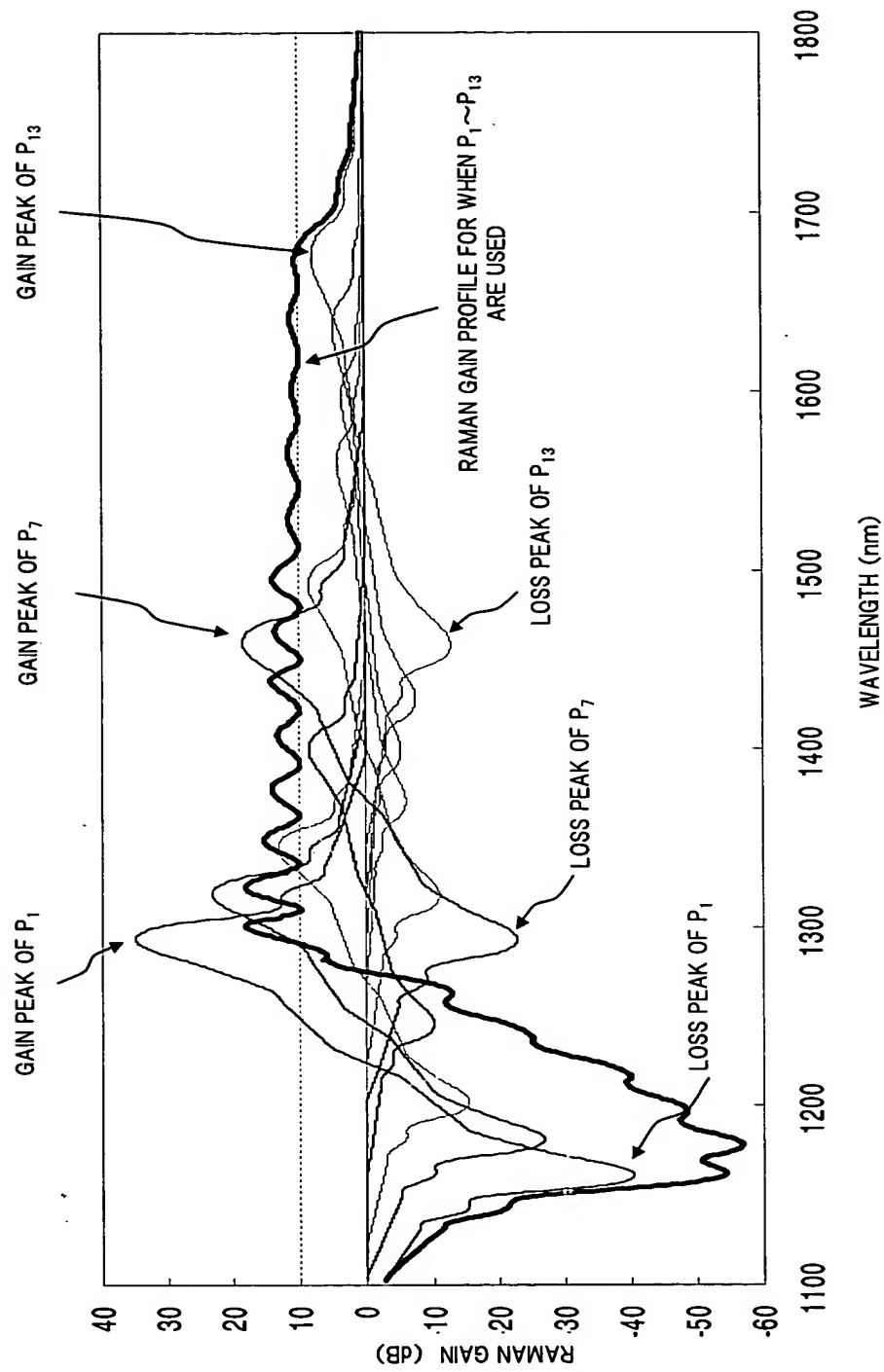


FIG.35

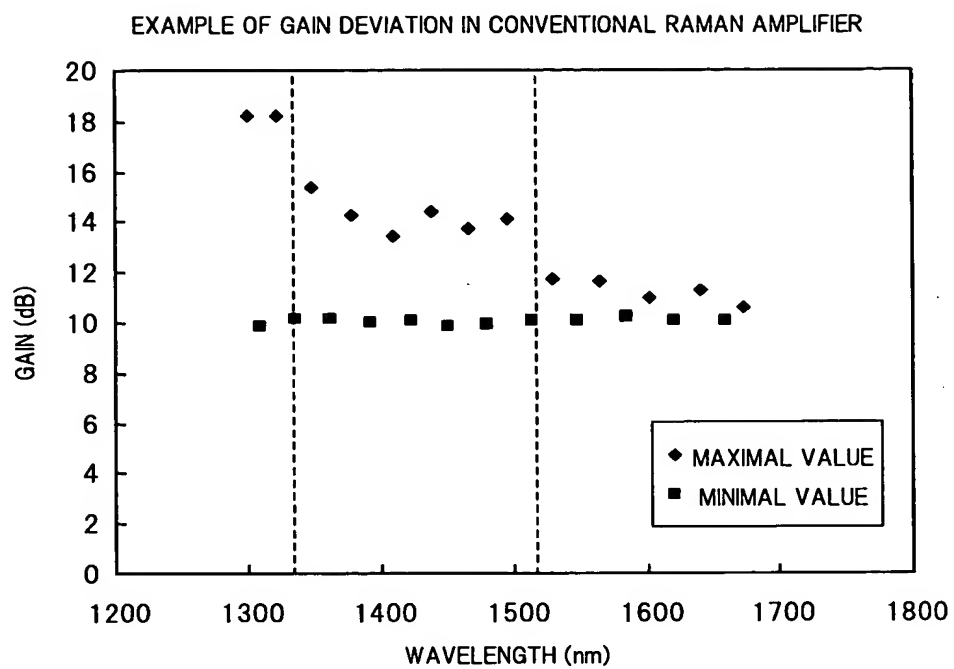


FIG.36

ENLARGED VIEW OF GAIN WAVELENGTH CHARACTERISTIC OF CONVENTIONAL RAMAN AMPLIFIER
HAVING AMPLIFICATION BANDWIDTH ABOUT FOUR TIMES RAMAN SHIFTED FREQUENCY

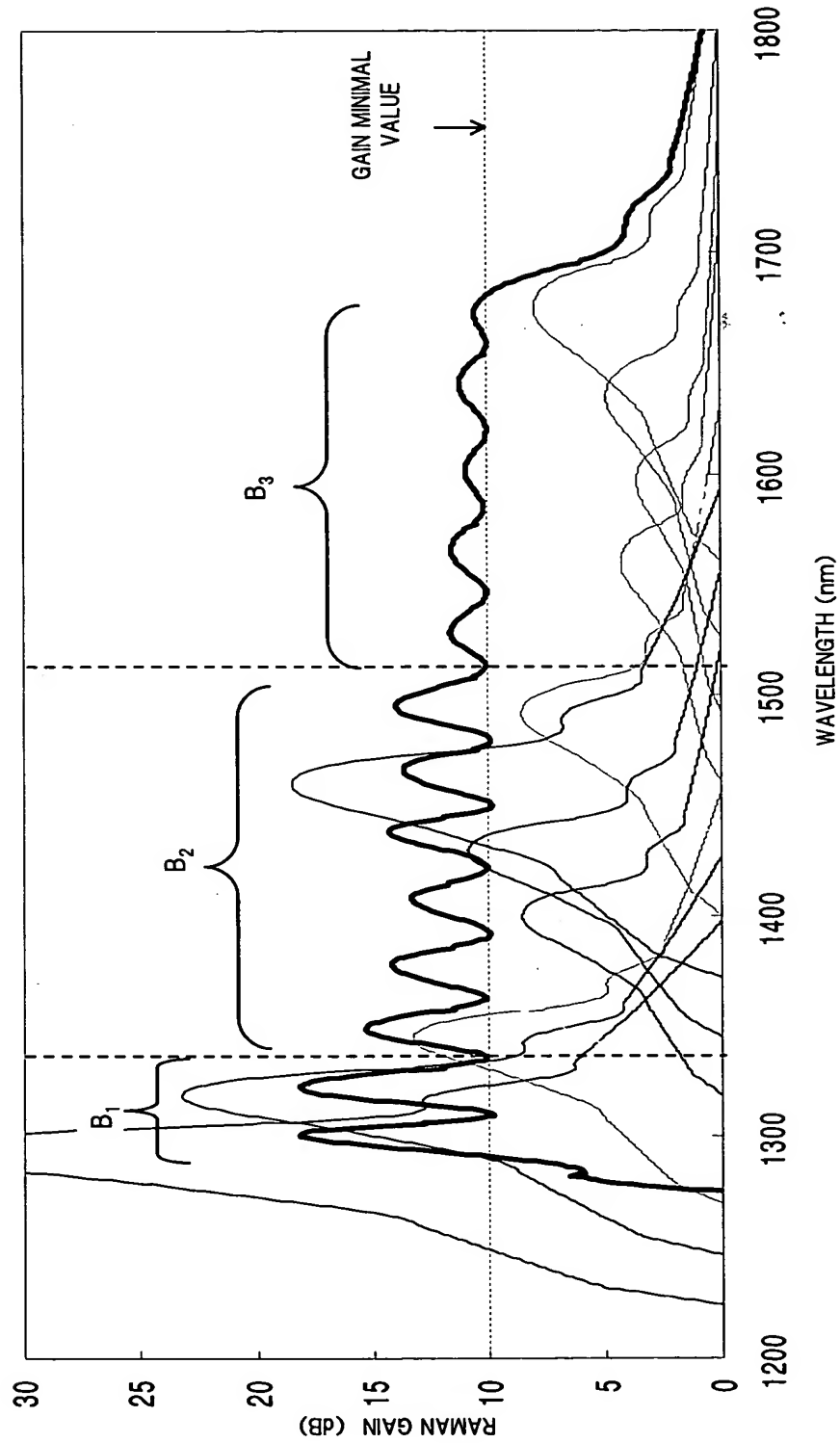


FIG.37

EXAMPLE OF GAIN EQUALIZATION OF GAIN WAVELENGTH CHARACTERISTIC OF CONVENTIONAL RAMAN AMPLIFIER BY OPTICAL FILTER HAVING PERIODIC LOSS WAVELENGTH CHARACTERISTIC

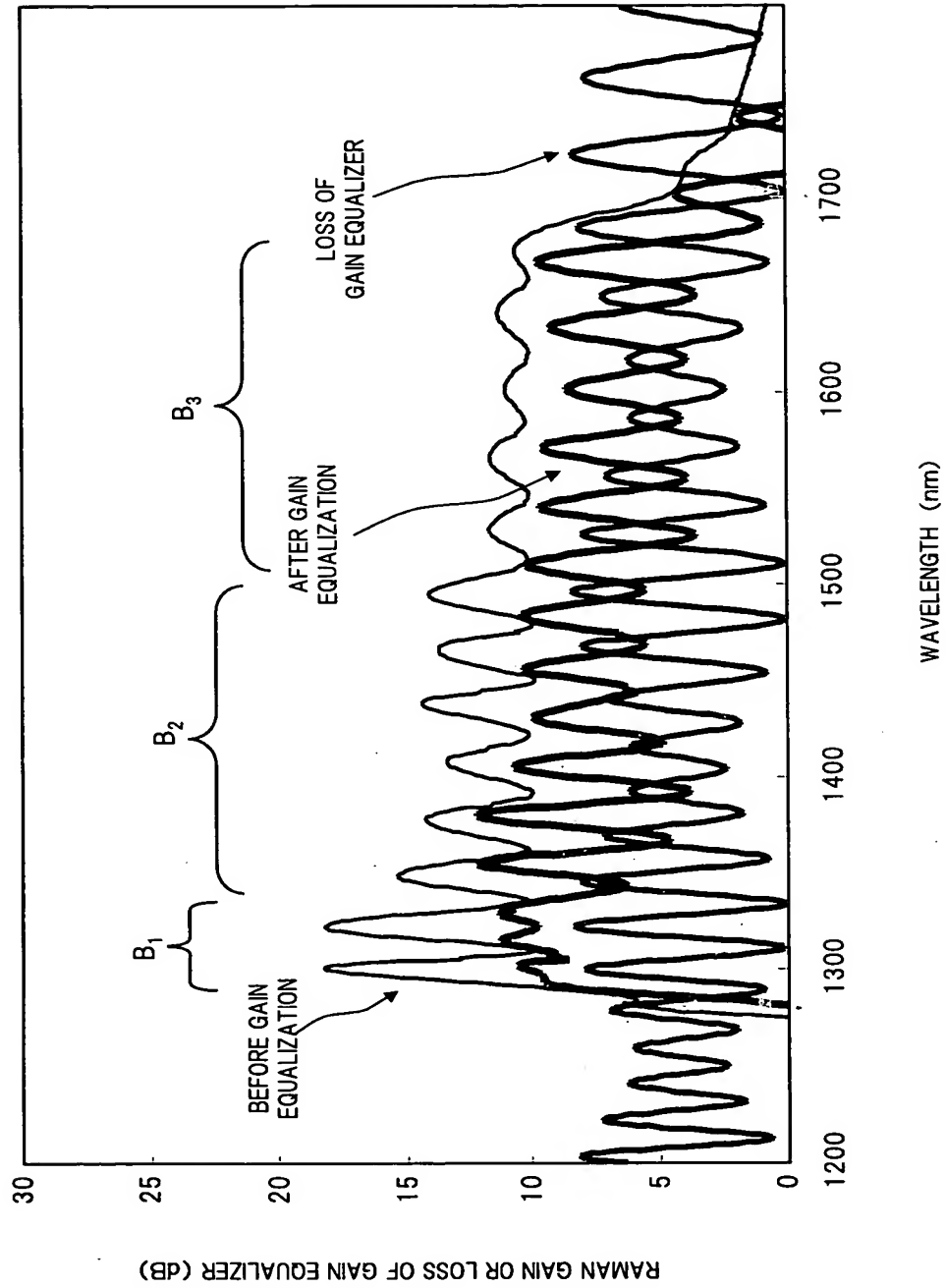


FIG.38

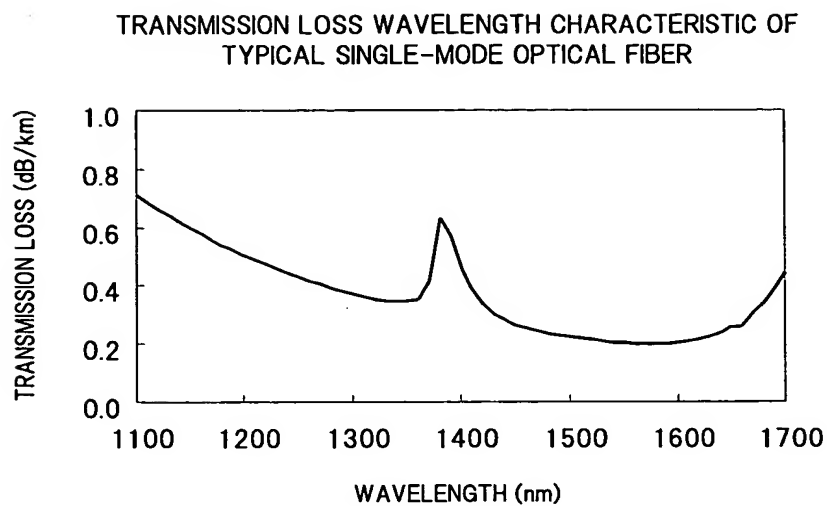


FIG.39

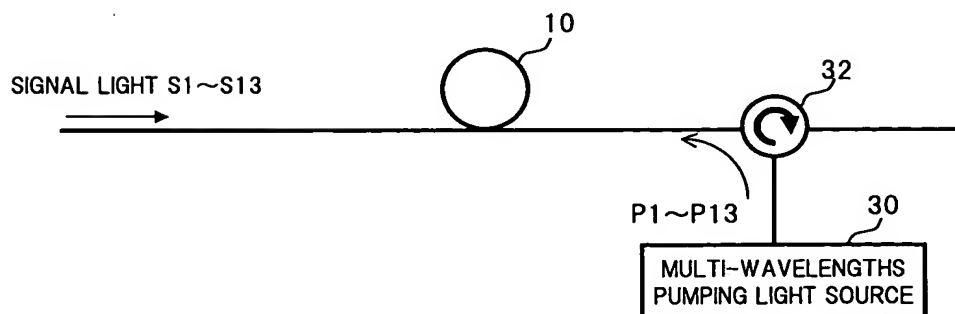
CONFIGURATION OF RAMAN AMPLIFIER IN
SEVENTH AND EIGHTH EMBODIMENTS

FIG.40

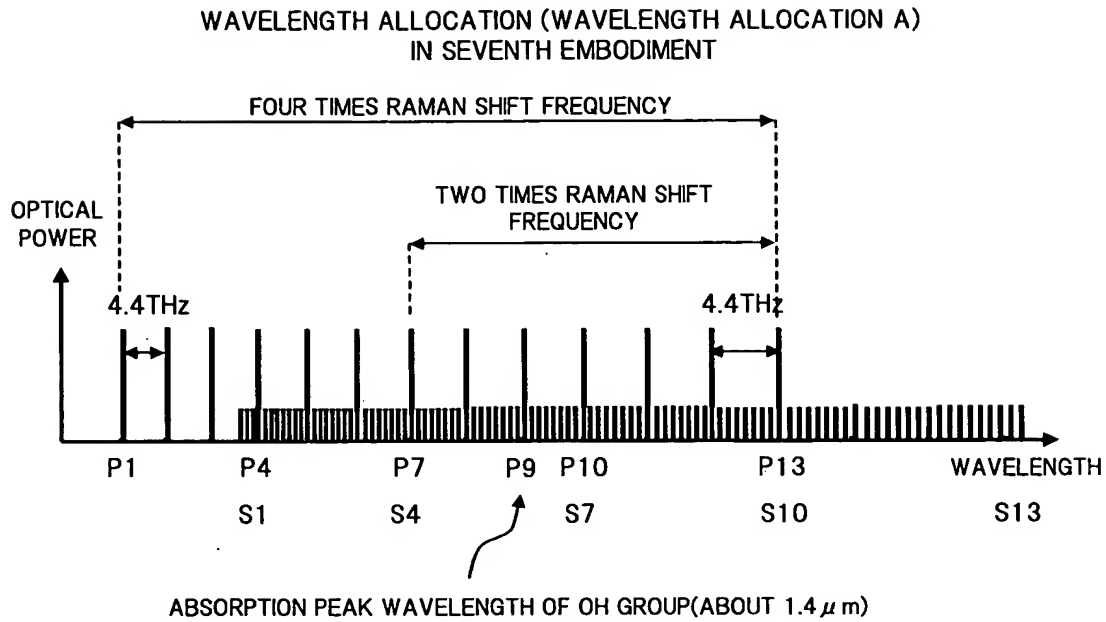


FIG.41

EFFECT IN EMBODIMENT

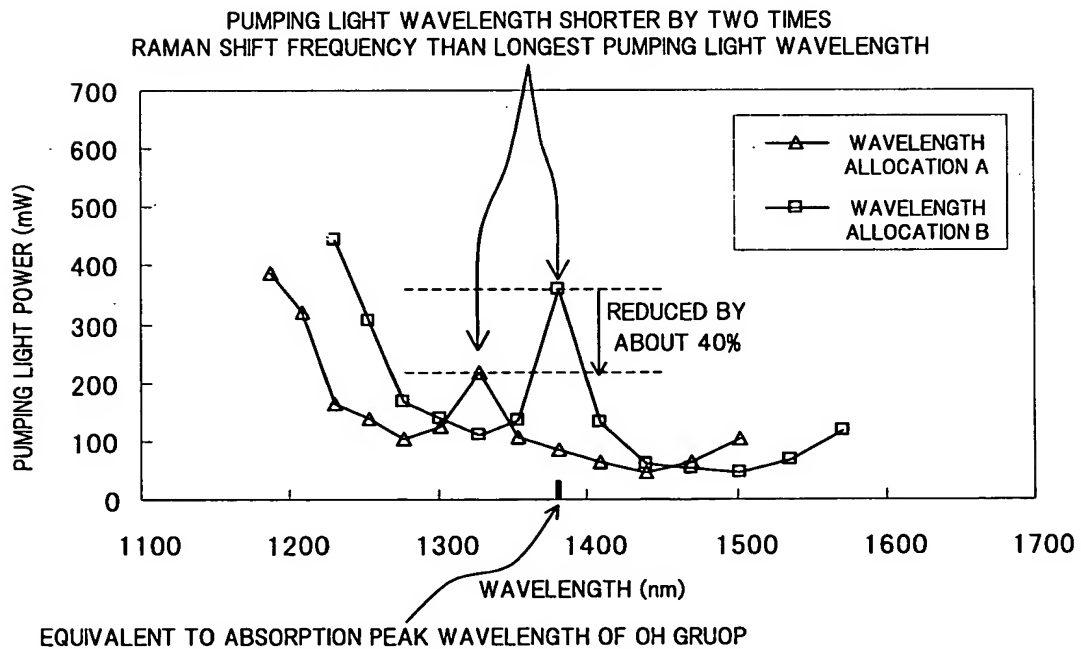


FIG.42

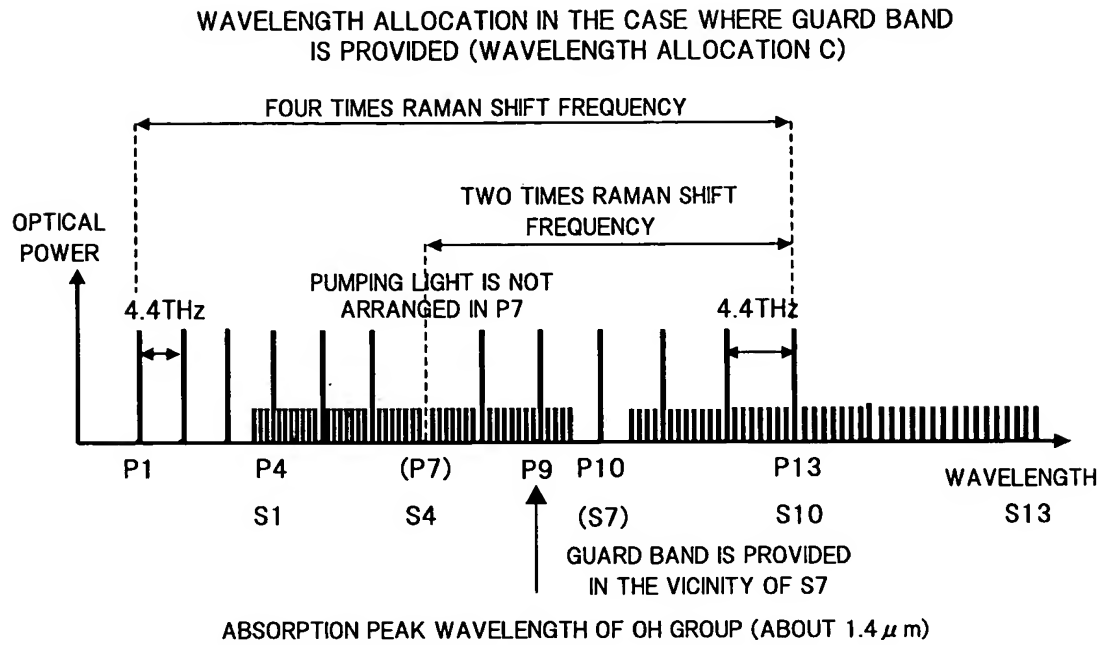


FIG.43

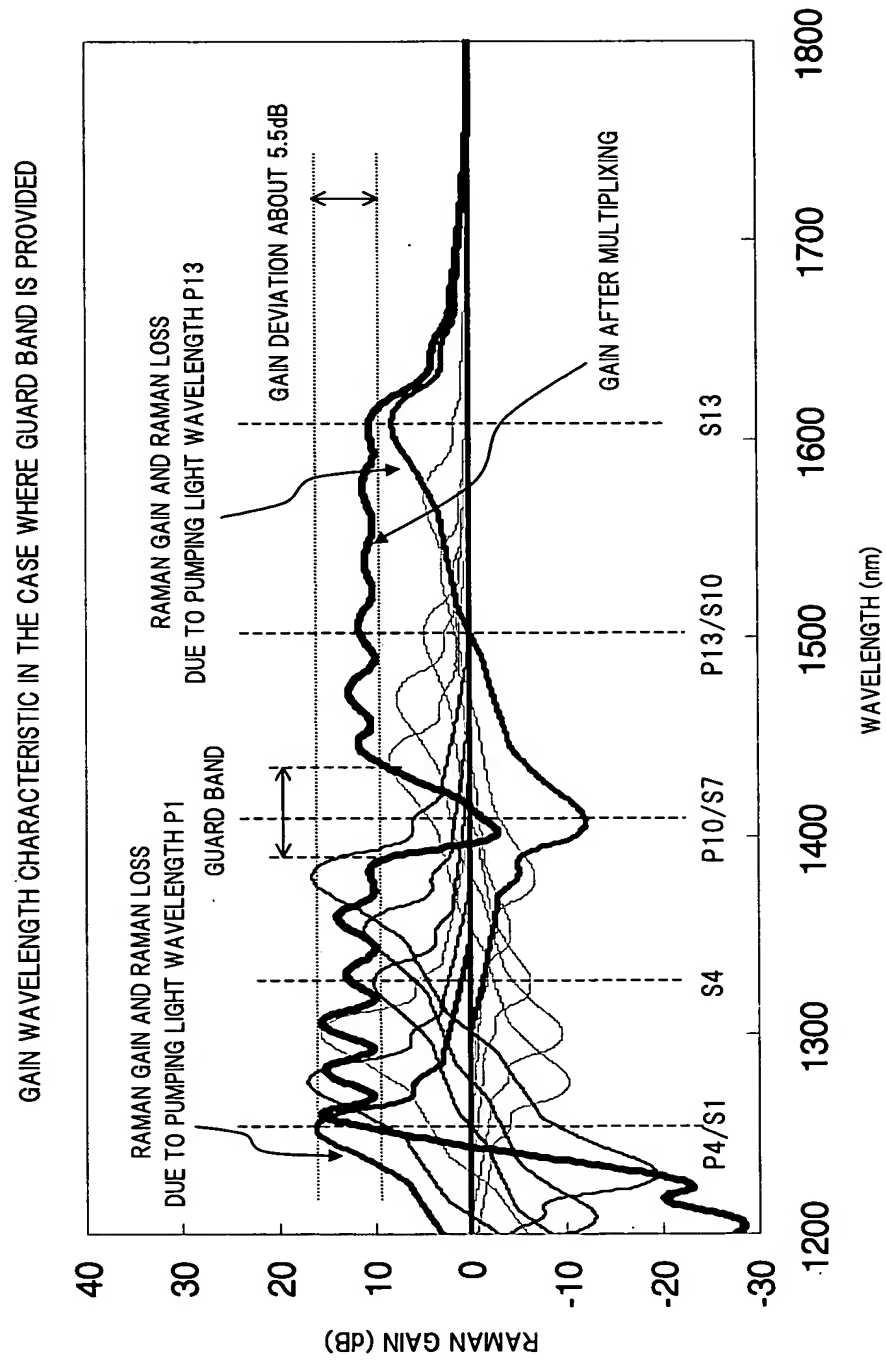


FIG.44

GAIN DEVIATION REDUCTION DUE TO PROVISION OF GUARD BAND

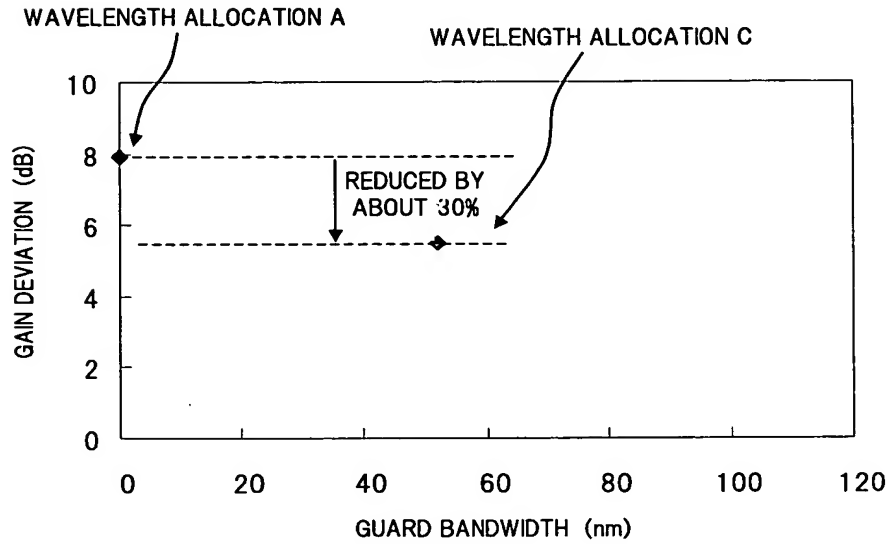


FIG.45

PUMPING LIGHT POWER IN THE CASE WHERE GUARD BAND IS PROVIDED

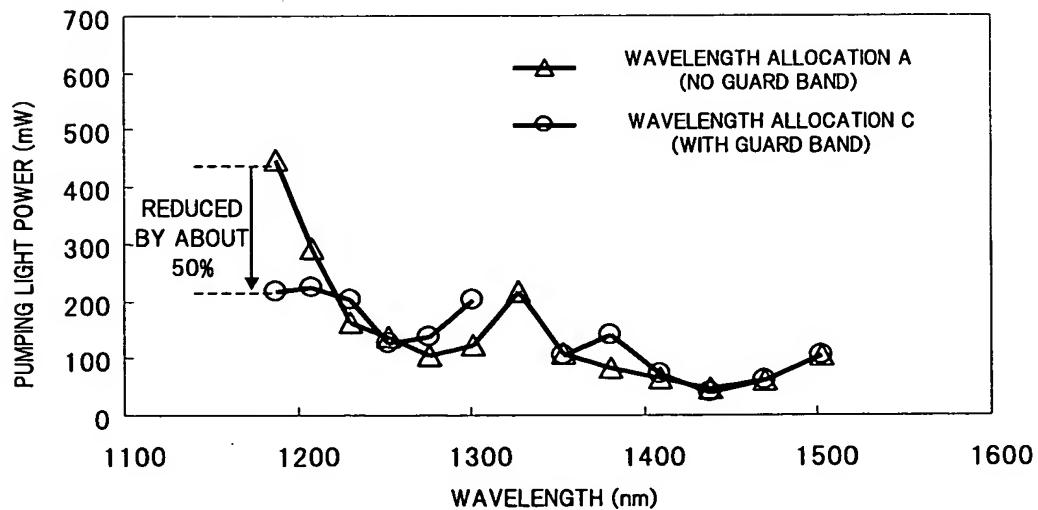


FIG.46

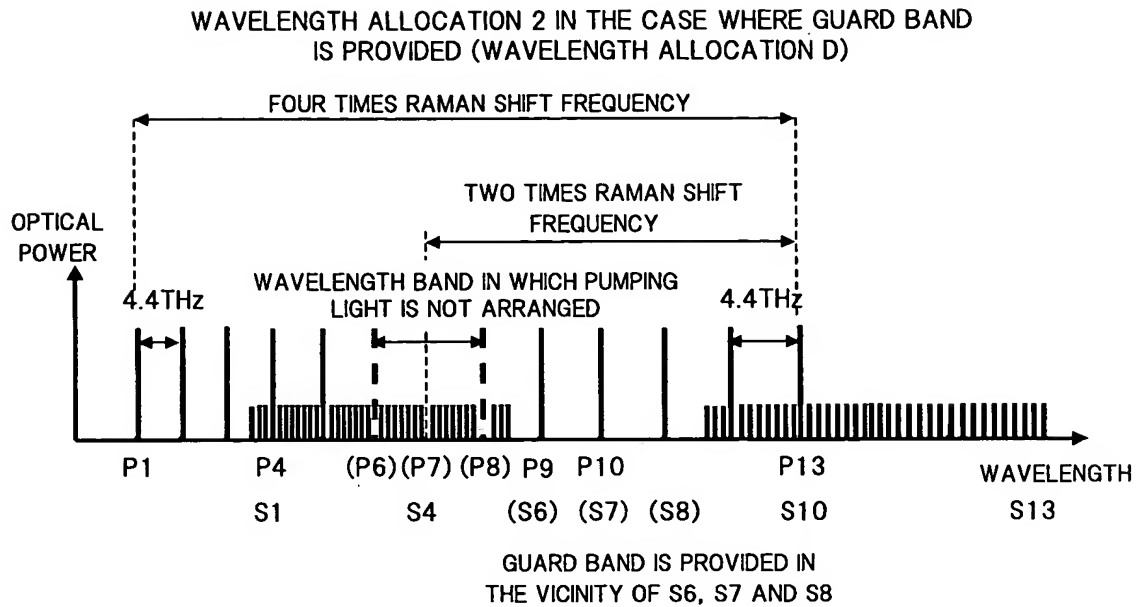


FIG.47

